

Application No.: 10/633,182
Amendment Dated March 28, 2008
Reply to Office Action of September 28, 2007

REMARKS/ARGUMENTS

Independent claim 1 has been amended by incorporating the subject matter of claims 2-3 and 5. Claim 1 has also been amended to recite a plurality of injection nozzles disposed in the stator blade. New claims 8-10 have been added. Support for these amendments can be found throughout the application as originally filed, including for example paragraph [0025] and Figure 2 of the published application (i.e. U.S. Publication No. 2004/0055626). Claims 2-3 and 5 have been cancelled. Claim 6 has been amended to correct dependency. Claim 7 has been cancelled.

Drawings

The drawings have been objected to under 37 CFR §1.83(a) for not showing every feature of the invention specified in the claims. Specifically, the Office contends that “the pressure sensor must be shown.” See the Office Action dated 9/28/2007, page 2, paragraph 4. Applicant respectfully submits that “pressure sensor” is not recited in the currently pending claims. Further, the recited pressure gage is illustrated on Figure 1 as reference numeral 15. As such, applicants request withdrawal of this objection.

The Office has also objected to the drawings for failing to comply with 37 CFR §1.84(p)(5). Specifically, the Office argues that reference numeral “2a” in Figure 2 is not mentioned in the description. As such, the Figure 2 has been amended by deleting reference numeral “2a”. A replacement sheet is attached at the end of this response. Applicants submit the submission of the replacement sheet overcomes this objection. Therefore, Applicant requests withdrawal of this objection.

Rejections under 35 U.S.C. §103

To establish a *prima facie* case of obviousness the prior art references must teach or suggest all claim limitations. Not one of the cited references teaches or suggests a plurality of water injection nozzles disposed in the stator blade such that a first plurality of nozzles is operatively positioned to cause water to flow onto the surface of the stator blade and a second plurality of nozzles operatively positioned to inject water onto a back surface of the moving blade, wherein the first plurality of nozzles is positioned upstream of the second plurality of nozzles.

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Moreover, none of the cited references teach or suggest an extraneous matter removing system including a first water injection nozzle disposed at a position upstream of the stator blade together with the aforementioned stator blade nozzle configuration. As such, any combination of the cited references also fails to teach or suggest the aforementioned stator blade nozzle configuration or a system including the recited stator blade nozzle configuration in addition to an injection nozzle positioned upstream of the stator blade. Accordingly, the Office has not proven a *prima facie* case of obviousness because the references cited do not teach or suggest each and every claimed limitation.

A. Rejection of Claims 1-3

Claims 1-3 stand rejected under 35 U.S.C. §103(a) as being obvious over Japanese Patent Publication No. 61-169627 to Moriya (hereinafter “Moriya”) in view of Japanese Patent Publication No. 60-69214 to Hibara (hereinafter “Hibara”).

Moriya teaches removing dust from a static vane 5 to rear vanes 6-10 that has accumulated during the operation of a blast furnace. See abstract. Moriya discloses using a differential pressure gauge 15 to detect the pressure rise. When the indicated pressure exceeds a pre-determined level, “cleaning water is ejected through cleaning water ejector 12 arranged in [the] gas inlet chamber 2 into the gas” to remove dust adhered to moving blades 6-10. See abstract.

Moriya, however, does not teach or suggest each and every element recited in currently amended independent claim 1. Specifically, Moriya is silent regarding a water injection nozzle disposed in the stator blade (as acknowledged by the Office), much less a plurality of nozzles disposed in the stator blade. Accordingly, Moriya necessarily fails to teach or suggest a plurality of water injection nozzles disposed in the stator blade such that a first plurality of nozzles is operatively positioned to cause water to flow onto the surface of the stator blade and a second plurality of nozzles operatively positioned to inject water onto a back surface of the moving blade, wherein the first plurality of nozzles is positioned upstream of the second plurality of nozzles. Moreover, Moriya fails to teach or suggest an extraneous matter removing system

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including a first water injection nozzle disposed at a position upstream of the stator blade together with the aforementioned stator blade nozzle configuration.

The Office relies on Hibara in an attempt to cure the deficiencies of Moriya. Specifically, the Office relies on Hibara for teaching the use of water injection from a stator blade to clean stator blade scale. Hibara teaches a specific nozzle for the spouting of pressurized water to prevent adhesion of scale build up in a turbine, not the details of a turbine itself. More specifically, Hibara teaches a nozzle configuration for discharging pressurized water having a water introducing hole 3 and a “spouting out” hole 4 bored from the ventral surface of the nozzle.

Like Moriya, Hibara is also silent regarding a plurality of water injection nozzles disposed in the stator blade such that a first plurality of nozzles is operatively positioned to cause water to flow onto the surface of the stator blade and a second plurality of nozzles operatively positioned to inject water onto a back surface of the moving blade, wherein the first plurality of nozzles is positioned upstream of the second plurality of nozzles as recited in claim 1. Moreover, Hibara also fails to teach or suggest an extraneous matter removing system including a first water injection nozzle disposed at a position upstream of the stator blade together with the aforementioned stator blade nozzle configuration. As such, Hibara necessarily does not teach or suggest each and every element of the currently claimed invention.

Since Moriya and Hibara both fail to teach or suggest a plurality of water injection nozzles disposed in the stator blade such that a first plurality of nozzles is operatively positioned to cause water to flow onto the surface of the stator blade and a second plurality of nozzles operatively positioned to inject water onto a back surface of the moving blade, wherein the first plurality of nozzles is positioned upstream of the second plurality of nozzles, any combination of Moriya and Hibara necessarily fail to teach or suggest the aforementioned stator blade nozzle configuration. Also, Moriya and Hibara both fail to teach or suggest an extraneous matter removing system including a first water injection nozzle disposed at a position upstream of the stator blade together with the aforementioned stator blade nozzle configuration. In view of the fact that both Moriya and Hibara fail to teach or suggest the same currently claimed elements, Applicant submits that the combination of Moriya and Hibara does not establish a *prima facie*

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case of obviousness. Therefore, Applicant respectfully submits that the obviousness rejections based on Moriya and Hibara have been overcome. Applicant requests withdrawal of this rejection.

B. Rejection of Claim 4

Claim 4 stands rejected under 35 U.S.C. §103(a) as being obvious over Moriya in view of U.S. Patent No. 4,384,452 to Rice (hereinafter “Rice”). The Office relies on Rice for teaching surface reformation. Claim 4 is dependent upon claim 1. As such, claim 1 also recites the aforementioned stator blade nozzle configuration.

In general, Rice is directed to a gas turbine using steam as a blade coolant instead of air. Rice teaches that steam is a superior coolant than air due to its preferred physical properties such as its thermal conductivity, specific heat, lower viscosity etc... Rice also teaches that hot corrosion is a concern due to the elevated temperatures of gas turbines. Providing a steam blanket over much of the blades as taught in Rice protects the steam covered areas (sections of the blades) from direct contact with the corrosive products of combustion. However, Rice teaches that a steam blanket cannot adequately protect the leading edges of the blades and therefore require a protective coating from the heat of the moving fluid. Accordingly, Rice teaches the use of protective coatings on leading edges because they are not adequately covered by the steam coolant.

Similar to Moriya, Rice is silent regarding a plurality of water injection nozzles disposed in the stator blade such that a first plurality of nozzles is operatively positioned to cause water to flow onto the surface of the stator blade and a second plurality of nozzles operatively positioned to inject water onto a back surface of the moving blade, wherein the first plurality of nozzles is positioned upstream of the second plurality of nozzles as recited in claim 1. Moreover, Rice also fails to teach or suggest an extraneous matter removing system including a first water injection nozzle disposed at a position upstream of the stator blade together with the aforementioned stator blade nozzle configuration. As such Rice suffers from the same deficiency as Moriya. Therefore, any combination of Moriya and Rice fails to teach or suggest all elements of the currently claimed invention. Applicant requests withdrawal of this rejection.

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C. Rejection of Claims 5 and 7

Claims 5 and 7 stand rejected under 35 U.S.C. §103(a) as being obvious over Moriya in view of Rice. Claims 5 and 7 have been cancelled.

D. Rejection of Claim 6

Claim 6 stands rejected under 35 U.S.C. §103(a) as being obvious over Moriya and Hibara in view of Rice. As currently amended, claim 6 is dependent upon independent claim 1. As such, claim 6 also recites the aforementioned stator blade nozzle configuration.

Since Moriya, Hibara and Rice all fail to teach the recited stator blade nozzle configuration, any combination of these references also fails to teach the recited stator blade nozzle configuration. Applicant requests withdrawal of this rejection.

Conclusion

In view of the current claim amendments and the foregoing remarks, Applicant submits that the pending claims are in condition for allowance. Applicant respectfully requests that the claims be allowed to issue. If the Examiner wishes to discuss the application or the comments herein, the Examiner is urged to contact the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

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Respectfully submitted,



John E. Johnson, III
Registration No. 58,367

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111
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